

Don't Waste Michigan \* Beyond Nuclear \* Nuclear Energy Information Service (NEIS)  
\* Michigan Safe Energy Future \* Three Mile Island Alert, Inc.  
Coalition for a Nuclear Free Great Lakes \* Religious Coalition for the Great Lakes \*  
Nuclear Information and Resource Service  
Radiation and Public Health Project \* Interfaith Council for Peace and Justice \* Water  
Walkerz \*  
North American Water Office \* Ban Michigan Fracking \* Michigan JustUs \* Michigan  
Citizens for Water Conservation  
Lone Tree Council \* West Michigan Environmental Action Council \* Manhattan  
Project for a Nuclear-Free World \*  
Don't Waste Michigan-Sherwood Chapter \* Saginaw CAP \* Flint Rising \* \* Books for  
Kids \* Grassroots Environmental Education  
Holy Spirit Missionary Sisters, USA-JPIC \* North American Water Office \* Freshwater  
Future \* Million Woman March Michigan \*  
The Ohio Nuclear Free Network \* Sierra Club Niagara Group \* Green State Solutions  
\* JVasi Consulting \* Western New York Drilling Defense \*  
Council on Intelligent Energy & Conservation Policy \* Rockland Coalition to End the  
New Jim Crow \* Concerned Citizens for Nuclear Safety  
Northeastern New Mexicans United Against Nuclear Waste \* San Clemente Green \*  
Mid-Missouri Peaceworks Unitarian Universalist Fellowship of Hidalgo County \*  
SEED Coalition \* Green Party of Ohio, Cuyahoga County \* WMU Students for Justice  
in Palestine \* Physicians for Social Responsibility - Kansas City and New York  
The Vermont Yankee Decommissioning Alliance \* Hudson Valley Climate Science  
and Solutions \* LEAF of Hudson Valley \* Citizen Action New Mexico \*  
San Luis Obispo Mothers for Peace \* Evon's Kreations \* Los Angeles Alliance for  
Survival \* Safe Energy Rights Group \*  
Indian Point Safe Energy Coalition \* Ecological Options Network \* Samuel Lawrence  
Foundation \* Oregon Conservancy Foundation \*  
Citizens Awareness Network \* Nuclear Watch South \* Portsmouth/Pikeon Residents  
for Environmental Safety and Security \*  
National Nuclear Workers for Justice \* San Clemente Green \* Hudson Valley Climate  
Science and Solutions Network \*  
True Earth \* Lucas County Green Party \* Mixto Communications \* Green Grassroots  
Election Protection \*  
Megiddo Peace Project \* Port Hope Community Health Concerns Committee \*  
Kalamazoo Nonviolent Opponents of War (KNOW)

State of Michigan  
Department of the Environment, Great Lakes and  
Energy

Water Resources Division

October 14, 2024

RE: Comments of Beyond Nuclear, Don't Waste Michigan, Michigan Safe Energy Future, Three Mile Island Alert, Nuclear Energy Information Service and other organizations and individuals on NPDES Permit No. MI0001457, Palisades Nuclear Power Plant, Covert, MI, requested by Holtec Palisades LLC

To the Michigan Department of the Environment,  
Great Lakes and Energy Water Resources Division:

The undersigned organizations offer their observations and comments on the draft National Pollution Discharge Elimination System (NPDES) permit proposed to be issued to Holtec Palisades LLC for the Palisades Nuclear Power Plant ("Palisades").

## **I. Introduction**

This NPDES permit, if it becomes final, will support the unprecedented restart of power generation activities at Palisades, a first for a shutdown nuclear power reactor in the United States and indeed, the world.

From a legal standpoint, an NPDES permit for a nuclear power plant fulfills a dual role. NPDES permits impose limits on contaminants allowed to emanate into local water sources, especially surface waters and pursuant to section 316(a) of the Clean Water Act (CWA), address thermal discharges into bodies of water. 33 U.S.C. § 1326(a). The permit also serves the purpose of fulfilling the NRC's responsibilities under the National Environmental Policy Act ("NEPA") respecting the assessment of environmental quality as it relates to water consumption for the plant's purpose.

The EGLE findings and conditions in the NPDES permit are final as to water-related aspects of operations. Section 511(c)(2) of the Clean Water Act

precludes the NRC from either second-guessing the conclusions in NPDES permits or imposing its own effluent limitations, thermal or otherwise. 33 U.S.C. § 1371(c)(2). The legal effect of these provisions is to make the Department of Environment, Great Lakes and Energy, Water Resources Division (“EGLE”), which stands in the shoes of the U.S. Environmental Protection Agency for NPDES purposes, the sole entity with regulatory authority over effluent limitations from Palisades.

## **II. Physical Plant Changes at Palisades**

The restart of Palisades will be accompanied by a number of important equipment and systems changes. According to EGLE, water intake usage at Palisades under the proposed NPDES permit would increase to 135 million gallons per day (“gpd”), up from previous usage of 110-115 million gpd. The plant will discharge 290,000 gallons per minute (“gpm”). The commenters believe that these quantities will vary, perhaps sharply, during the “shakedown” phase of operations, with a combination of new and untested as well as old and possibly less-reliable, componentry in the Palisades reactor operations.

On October 7, 2024, a Petition for Leave to Intervene in ongoing Nuclear Regulatory Commission license amendment proceedings was filed by Beyond Nuclear, Three Mile Island Alert, Don’t Waste Michigan, Nuclear Energy Information Service, and Michigan Safe Energy Future. In that proceeding, the intervening organizations have filed the Declaration of Arnold Gundersen, a longtime nuclear power plant engineer, as their expert.

Petitioners’ expert witness Gundersen identifies multiple potential climate change impacts in his declaration which the undersigned organizations submit for consideration by EGLE in its deliberations over a NPDES permit renewal for Palisades.

77. According to the Government Accountability Office (GAO), the NRC is responsible

for addressing the impacts of worldwide climate change at any federal nuclear power plant license. At Holtec Palisades, these responsibilities include creating new and detailed analyses of any environmental and safety issues that may be caused by climate change. For example, higher lake temperatures and cooling tower blowdown discharges at Holtec Palisades adversely affect the aquatic communities crucial to Lake Michigan.

78. Significant climate-related issues affect the safety systems at Holtec Palisades and must be addressed before the facility receives a new operating license. However, Holtec Palisades Corp continues to ignore them. For example, ultimate heat sink temperatures, wind forces, snow loads, and rain accumulation are some climate related changes that could adversely affect the safe operation of Holtec Palisades. They have yet to be addressed by either Holtec or the NRC.

79. Holtec Palisades states that its new, state-of-the-art condenser (procured at great expense from its wholly-owned subsidiary) will have twice the heat transfer surface as the old condenser [heat exchanger] it is replacing. This new modified condenser seems to be a solution in search of a problem. Let me explain.

80. Beginning three years after its initial construction by Consumers Power, Palisades was cooled by two large banks of mechanical draft cooling towers. Heated water from the condenser is sent to the cooling towers. The cooling towers transfer heat from the heated water to cooler air by evaporating the water into the air, making the air warmer, and reducing the water temperature. Now, at a lower temperature, this water is returned to the plant, where it is heated yet again, and the cycle is repeated

throughout plant operation.

81. Climate change is increasing the atmospheric temperature, especially in the summer. As the summer air becomes hotter, cooling tower evaporation is reduced, and the water leaving the cooling tower and returning to the plant is cooled less than when the plant was designed in 1965. As a result, the warmer water returning from the cooling towers is not as cool as needed for optimal plant performance, so back pressure on the turbine increases, and electric power output is reduced.

82. While it is gratifying that Holtec Palisades acknowledges that global climate change is adversely affecting the 60-year-old design of its Palisades reactor, the remainder of their claim is dubious at best.

83. Holtec Palisades states that, because of increasing temperatures of water from Lake Michigan caused by global climate change, the old condenser at Palisades was inadequate for removing heat from the nuclear chain reaction. Based on this assertion of inadequacy, Holtec Palisades replaced the old condenser with an entirely new, unproven product designed and constructed by a Holtec International subsidiary. Holtec Palisades now states that this new condenser will have twice the heat transfer surface to remove excessive heat necessitated by the warming of Lake Michigan.

84. The basis for the claim by Holtec Palisades that a new condenser (provided by a subsidiary of Holtec International) was needed is undoubtedly questionable. Simply cooled by water circulating through two banks of cooling towers. Water from the cooling towers cools the condenser, NOT water from Lake Michigan. The cooling tower water temperature depends on the wet-bulb evaporative temperature of the

atmosphere, not on the water temperature in Lake Michigan. The standard solution if heat dissipation is inadequate is to add additional cooling towers, not to replace the condenser.

85. For three years after Palisades originally started, it was cooled by lake water. However, cooling towers replaced direct lake withdrawals because of damage to the lake's aquatic environment. Perhaps Holtec Palisades plans to withdraw and discharge water directly into Lake Michigan at some later date and is using public funds to accommodate that future plan. However, Holtec Palisades' assertion that the increasing lake temperature is the cause for installing a new condenser is false because atmospheric heat transfer from the cooling towers is what cools the condenser.

86. Building a larger condenser without other significant plant improvements fails to address the underlying climate change issue. With the current increases in summer temperatures, the cooling tower performance is simply inadequate on hot summer days. Building more cooling towers and increasing their water flow would be the appropriate climate change solution to improve plant performance during summer.

87. Instead of adding cooling towers and increasing the water flow at Palisades, Holtec's proposal to modify the plant condenser will have minimal effect on plant output without other major costly modifications. However, it will create six new technical and additional ecological and environmental obstacles that must be addressed well before a restart is approved.

87.1. Evaporative losses from Palisades, as evidenced by more steam and smoke,

will be increased, creating more ground fog for extended periods. How will this impact the surrounding community by creating more extensive fog? Are there highways or traffic patterns that may be affected significantly?

87.2. Increased Drift particles containing biocides and other chemicals will fall into the environment within a few miles of the plant. How will this impact farms and farm products, schools and children attending, and any nearby highways, agriculture, state or county park systems, recreational activities, and tourism, to name a few?

87.3. Increased cooling tower blowdown containing biocides and other chemicals will also be released directly into Lake Michigan. How will that impact the overall aquatic health of the Lake, including and not limited to the Lake's fisheries, marine species, commerce, tourism, recreation, etc.? Four miles north, South Haven draws its drinking supply from Lake Michigan. If so, how must it be treated differently to protect the lake's fragile ecological systems and human consumption?

87.4. With the increased requirements for more cooling water, more water will be drawn from the lake, with the death of accompanying fish larvae and mature fish.

87.5. Most likely, the existing pumps used to withdraw water from the lake to supply water to the cooling towers are inadequate for the additional heavy use of such old equipment. Therefore, the older outdated pumps would require replacement with larger pumps and associated piping well before reactor restart. Such piping expansion and the implementation of new pumps would require significant

redesign and implementation of the lake draw-down area and redesign to protect fish and other aquatic species.

87.6. Additionally, circulating water flow through the condenser and to the cooling towers would dramatically increase, requiring even larger pumps.

88. It is incredibly disconcerting that such environmentally consequential and ecologically sensitive areas would be burdened without environmental and ecological studies to minimize harm. Furthermore, it is disturbing that Holtec applauds this solution to the occasional summer reduction in electric output as the solution to a tremendous increase in profit to a wholly owned subsidiary. The State of Michigan, county, and surrounding city areas should have their environment protected rather than burdening the local area to make more corporate profits. With these proposed changes, Holtec will increase the condenser surface area two-fold without modifying the cooling towers or ancillary systems.

According to Mr. Gundersen, physical changes are being made to Palisades to install a new condenser that is not consonant with the present cooling tower systems. There will be possibly significant environmental effects as a result. There will be a dramatic projected increase of some 20 million gallons per day being drawn from Lake Michigan. The warmer water from Lake Michigan will be more prone to heat up and increase the amount of drift particles containing biocides and other chemicals being used within Palisades. These contaminants will be deposited on land and in Lake Michigan at downwind sites from the plant. Also, warmer water overall will be returned to Lake Michigan.

Mr. Gundersen predicts larger amounts of polluted blowdown water from the cooling towers as the temperature of the water being recirculated through the plant is not cool enough to ensure safe operations. He foresees increased cooling tower



blowdown containing biocides and other chemicals and that overall aquatic health of the Lake, including and not limited to the Lake's marine species and aquatic habitat, will be affected. The existing pumps used to withdraw water from the lake to supply water to the cooling towers are inadequate for the additional heavy use of increased volumes of water needed. The older outdated pumps should be replaced with larger pumps and associated piping before reactor restart.

### **III. Comments on Proposed NPDES Permit**

EGLE has identified modifications to previously issued NPDES permits. New conditions have been added to the draft permit:

- ▶ Intake Structure Monitoring
- ▶ Quantification Levels and Analytical Methods for Selected Parameters
- ▶ Pollutant Minimization Program for Hydrazine
- ▶ Pollutant Minimization Program for Spectrus CT-1300
- ▶ Discharge Monitoring Report – Quality Assurance Study Program
- ▶ Priority Pollutants
- ▶ Continuous Monitoring
- ▶ Power Plants – PCB Prohibition
- ▶ Monitoring Frequency Reduction
- ▶ Plant Start-Up Notification.

Commenters concur that the above identified new conditions are areas of concern and advocate increased frequency of monitoring. Lake Michigan provides drinking water for 16 million people.

1. The chemicals of Hydrazine, Spectrus CT-1300 (Betz Clamtroll), Spectrus DT-1403, Spectrus, Hydrazine, Betz inhibitor, AZ8100 (TTA), GENGAURD GN8020 raise particular concern. The International Joint Commission has identified these chemicals as Persistent Toxic Chemicals (1991) which must be eliminated from use in the Great Lakes. The IJC has reaffirmed biannually the position of elimination of these chemicals. The International Joint

Commission (IJC) has committed to nearly eliminating the discharge of persistent toxic substances (PTS) in the Great Lakes Basin Ecosystem. PTS are toxic chemicals that can remain in the environment for many years and contaminate food sources for people and animals. Over time, these chemicals can mix with other chemicals and become more potent, or can harm large parts of the ecosystem.

2. Final effluent limitations and loading reporting requirements for Hydrazine, SpectrusCT-1300 (Betz Clamtroll), Spectrus DT-1403, Spectrus, Hydrazine, Betz inhibitor, AZ8100 (TTA), GENGAURD GN8020 must be made stricter, tighter. That is, to work toward virtual elimination as IJC advises, with less discharge. Do not modify and provide updates to NPDES which allows continued, grandfathered persistent toxic chemicals to be discharged into Lake Michigan when current EPA standards advise against exemptions to do so. Rolling modifications since NPDES last issued in 2014 had been to relax standards so as not to trigger NPDES violations.

3. The four day cutoff for the intermittent discharge limit for Hydrazine must be made more restrictive, and not to allow an average over months limit. Acute impacts are of great concern. Palisades located next to Van Buren recreational state park results in hundreds, potentially thousands of Lake Michigan beach goers on weekends, holidays potentially being exposed to persistent toxic chemicals. Reports of Lake Michigan frothing foam and persons being caught up in chemical cocktails have been made at the October 1st Hearing. There must be sirens and alarms to notify the Public of any discharge above limits which are meant to protect the Public from exposure. Michigan Part 4 Water Quality Standards and Part 8 Water Quality-Based Effluent Limit Development for Toxic Substances must be tightened, not loosened and not grandfathered under previous standards.

4. Much more is known in 2024 about the toxicity of the chemical cocktails in use at Palisades than a decade ago in 2014 when the NPDES was last reviewed in

whole. The 2014 previous NPDES permit authorized continuous discharge of 110-115 million gallons per day. Over the past decade that is now reported as continuously discharge a maximum of 135.2 million gallons per day (MGD) of noncontact cooling water, cooling tower blowdown, and miscellaneous treated low-volume wastewater consisting of steam generator blowdown, demineralizer backwash and regeneration waste, reverse osmosis filter backwash, turbine sump drainage, floor drainage, laboratory waste, and radwaste wastewater from Monitoring Point 001A through Outfall 001. What NEPA compliance requirements are in place regarding water usage of over 50 million gallons per day, and what do they prescribe? Are they being met?

5. What is state of the art in 2024 regarding the ratio of dilution? The 1-part effluent to 10 parts receiving water does not meet modern conservatism, and does not adequately protect the public from extremely persistent toxic substances. Adjacent communities have reported and documented elevated occurrences of cancer. More conservatism is necessary to prevent future deleterious health impacts. Rule 323.1082(5) of the Part 4 Michigan Water Quality Standards (WQS). Lake Michigan is designated as cold-water and is protected as a public water supply. As the Public is being exposed to persistent toxic substances more conservatism is needed.

6. Monitoring of hydrazine must be in real time and not limited to grab sample monitoring. Real time monitoring with alarm and constant readout which can be audited by the public. Voluntary reporting of compliance is not acceptable, there must be oversight and accounting of all discharges. Use of hydrazine is as water treatment additive and it is an oxygen scavenger to protect the steam generators and other plant components from degradation due to corrosion by maintaining a sufficiently low electrochemical potential (ECP). This would be increased, despite the availability of less-harsh water chemistry options.

7. Hydrazine is a carcinogen and Lake Michigan is protected as a public water supply source. Concentrations of hydrazine in the Outfall 001

final effluent from August 2013 through April 2024 ranged from not detected to 14.63 micrograms per liter (ug/l). The quantification level used for the not detected results ranged from <0.29 ug/l to <5 ug/l with a majority of the not detected results reported as <5 ug/l. These data indicate there is a reasonable potential for hydrazine to be discharged at concentrations exceeding Michigan WQS.

8. Under previous 2014 NPDES methodology and limits became modified enabling continued elevated levels of hydrazine through averaging and allowance of elevated discharges during refueling and forced outages.

Palisades Nuclear Plant - Entergy submitted through Smothers, Ryan rsmothe@entergy.com an undated request:

Palisades Nuclear Power Plant, owned and operated by Entergy corporation, is requesting to modify NPDES Permit No. MI0001457 Part I, Section A.1.e. Currently this section states that the quantification level for hydrazine shall not exceed 3.0 µg/l unless a higher level is appropriate because of sample matrix interference. This request is to modify the maximum quantification level to a value of 8.0 µg/l or higher.

At June 4, 2024 Factsheet

*The facility has concerns meeting the WQBEL of 1.0 ug/l (1.2 lbs./day) during refueling outages and other forced outages as higher concentrations of hydrazine may be required to maintain system components. The facility indicated that during these operations, the discharge duration is short. Based on this information and to ensure Michigan WQS for hydrazine will be met in Lake Michigan,*

*we recommend a daily maximum WQBEL of 32 ug/l (36 lbs./day) be applicable during refueling and other forced outages. Compliance with this limitation shall be daily during these events with samples collected as grab samples and analyzed using ASTM Method D1385-07 with a quantification level of 3.0 ug/l. In addition, we recommend the draft NPDES permit include a notification requirement to document these refueling and other outages. The notification shall include the date and time when the discharge began and ended. Finally, we recommend the draft NPDES permit include a report requirement for the discharge duration reported as total minutes or total hours during these refueling and other outages. (italic added)*

9. The recommendations of daily maximums of hydrazine at 32 ug/l at 36 lbs./day is unacceptable and opens potential gaming of the recordation and could work to avoid recommendations to reduce the use of hydrazine. Real time auditable, transparent and publicly available data on all persistent toxic substances must be baseline. The International Joint Commission has called for virtual elimination of these persistent toxic substances since 1991 and reaffirmed them ever since.

In 2020(yr) Palisades Nuclear Power Plant, owned and operated by Entergy corporation, requested to modify NPDES Permit No. MI0001457 Part I, Section A.1.e. Currently this section states that the quantification level for hydrazine shall not exceed 3.0 µg/l unless a higher level is appropriate because of sample matrix interference. This 2020(yr) request is to modify the maximum quantification level to a value of 8.0 µg/l or higher. The level of hydrazine has been increased so as not to exceed NPDES exempted limit. Hydrazine levels must not be grandfathered.

10. EPA Region 5 in a letter dated August 16, 2024 writes: Although we currently do not

intend to object, EPA recommends you consider and address the comments identified in Enclosure A in order to improve the overall permit.

11. The commenters object to any increase use of hydrazine and to the methodology of averaging during refueling and outages. When hydrazine is in greater use, recordation must not be obscured through use of average. Previous advocacy of thirty six pounds per day of hydrazine could result in over six tons per year, with minor permit modification. Hydrazine is a known carcinogen, substitute chemicals are available.

12. Real time monitoring with alarms and constant readout is obligatory in order to provide the public with the transparency necessary to have confidence in the NPDES process, and compliance.

13. Community participation must be a crucial element of any permitting process, particularly one that carries with it such grave consequences for communities in and around the discharge area. Additional Public Hearings would be most valuable to MI EGLE as the Permit process is considered. The denial of renewal of the NPDES Permit at Palisades should be considered. What are the social and environmental costs to resurrect Palisades through exemption upon exemption with the financial burden being placed upon state and federal taxpayers and ratepayers to the tune of several billion dollars? All costs and risks are being borne by the public. Monitoring of discharge at Palisades with all of the bells, whistles, buzzers, alarms, auditing and real time readout must be in place. When operational, a large nuclear plant can generate about \$1 million in revenue per day. With billions of dollars in governmental finances being provided to Holtec, robust monitoring must be in place. It is the cost of doing business.

14. Limits must be placed on Palisades thermal pollution of Lake Michigan that are in alignment with

the recommendations of the EPA. Discharges that harm our environment and don't comply with the Clean Water Act and go against the Environmental Protection Agency's recommended actions regarding thermal limits must be put in place. At the Public Hearing on October 1, 2024 members of the public reported current NPDES (2014 origin) to allow for 2100 Million BTUs, when the actual thermal output of Palisades was reported at 500 Million BTUs. If that Public testimony is anywhere in the ballpark, that discrepancy must be reviewed and reconciled. The thermal limit must be set at a level that provides genuine regulation, with a defined basis for having set it at that level.

15. Palisades must be required to stop discharging the banned chemicals and reduce those that are harming Lake Michigan. These include several types of polychlorinated biphenyls (PCBs); Phosphorus; Lead; Copper. Please include and review any asbestos streams which could impact Lake Michigan.

16. The National Pollutant Discharge Elimination System (NPDES) permits should not extend beyond five years without review. The current NPDES has not been fully reviewed for ten years. Quarterly reporting on the NPDES would much better serve the Public. We request monitoring and enforcement with a swift timeline for action.

## **17. Conclusion**

The Commenters call on the Michigan Department of Environment Great Lakes and Energy (MI EGLE) to use their legal authority to regulate radionuclides (radioactive by-products and elements) that pollute our drinking water sources and threaten our safety. MI EGLE must use the regulatory authority that it already possesses to eliminate radioactive byproducts from our drinking water sources. Please clarify Radionuclide Monitoring Responsibility and interface between MI EGLE and NRC.

Thank you for the MI EGLE Hearing on  
October 1, 2024 and for the extended deadline due to  
conflicting NRC / NPDES dates.

Sincerely,

Organizations

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     Freshwater Future  
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     Books for Kids  
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